US Army Medical Research and Materiel

Technology Available for Licensing

Protective Peptides Neurotoxin of *C. botulinum*

Features and advantages:

- **Amplifies and clones over-lapping segments of the BoNT/A gene**
- **Can be used to express and purify fragments of BoNT/A**
- **Two heavy chain fragments were clearly able to confer protective immunity in mice**
- **Majority of fragments shown to elicit antibody**

This invention provides peptides of the *Clostridium botulinum* neurotoxin's heavy chain and methods for using the peptides to immunize against the toxic effects of the neurotoxin.

There are seven serologically distinct types of botulinum neurotoxin (BoNT). Each type consists of a light and a heavy chain linked by a disulfide bond. The BoNTs are among the most potent toxins known to man in which ingestion or inhalation inhibits neurotransmitter release from synaptic vesicles, resulting in neuroparalysis and death. The methods of the invention were used to identify specific sequences that amplify and clone overlapping segments of the BoNT serotype A (BoNT/A) gene. The segments can be expressed in suitable vectors such as *E. coli* to produce truncated BoNT/A proteins of about 15-30 kDa in size. The BoNT/A peptides in turn give rise to protective antibodies that can be fused to other peptides that act as adjuvants. The fusion proteins can be produced by recombinant technology using plasmids containing hybrid genes for their expression. When tested in mice, the BoNT/A proteins from the heavy chains were [illegible] protect the majority of animals from death.

A genetically engineered vaccine would eliminate [illegible] production problems since it can be expressed in a recombinant host at high levels and would be an improvement over the current vaccine as it would not require inactivation with formalin before use.

Patent Status

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